HRS DOCUMENTATION RECORD

San Jacinto River Waste Pits
Harris County, Texas
TXN000606611

Prepared in cooperation with the
U.S. Environmental Protection Agency

Prepared September 2007;
Revised March 2008

9298907

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SIGNATURE PAGE

Marshall Cedilote — Date
Texas Commission on Environmental Quality
Site Investigation Manager

Lloyd Johnson — Date
Texas Commission on Environmental Quality
Quality Assurance Officer

Marshall Cedilote — Date
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PA/SI Grant Manager

Melissa Cordell — Date
Texas Commission on Environmental Quality
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Brenda Nixon-Cook — Date
U.S. Environmental Protection Agency

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Texas Commission on Environmental Quality
and the
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Prepared by the

Texas Commission on Environmental Quality
Austin, Texas

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[1] Revised March 2008

TABLES

FIGURES

1.0 INTRODUCTION

The Hazard Ranking System (HRS) is the principal mechanism the U.S. Environmental Protection Agency (EPA) uses to place sites on the National Priorities List (NPL). The HRS serves as a screening device to evaluate the potential for releases of uncontrolled hazardous substances to cause human health or environmental damage. The HRS provides a measure of relative rather than absolute risk. It is designed so that it can be consistently applied to a wide variety of sites.

2.0 HRS DOCUMENTATION RECORD - REVIEW COVER SHEET

SITE NAME: .....SAN JACINTO RIVER WASTE PITS

CONTACT PERSON:

Documentation Record: .....Brenda Cook, USEPA 214/665-7436
Region 6 NPL Coordinator

Pathways, Components, or Threats Not Scored

Ground Water Migration Pathway

The Ground Water Migration Pathway was evaluated and not scored due to lack of documentation of a release to ground water pathway targets and because inclusion of this pathway would not significantly affect the site score.

Surface Water Migration Pathway

The Ground Water to Surface Water Migration Component Drinking Water Threat was evaluated and not scored because inclusion of this component would not significantly affect the site score. While the Environmental Threat was not scored, state endangered or threatened species are identified within the immediate vicinity of the site and the impacts of contamination released from the site will be considered when EPA performs more extensive investigation under the RI/FS.

Soil Exposure Pathway

The Soil Exposure Pathway was evaluated and not scored due to lack of documentation of exposure to targets and because inclusion of this pathway would not significantly affect the site score.

Air Migration Pathway

The Air Migration Pathway was evaluated and not scored due to lack of documentation of a release to air migration pathway targets and because inclusion of this pathway would not significantly affect the site score.

NOTES TO THE READER

The following rules were used when citing references in this HRS Documentation Record:

1. All references attached to this report have been stamped with a designated page number (example: Ref. 1, p. 10 = 01 010).

2. The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), Texas Air Control Board (TACB), and Texas Natural Resource Conservation Commission (TNRCC), referred to throughout this report are now known as the Texas Commission on Environmental Quality (TCEQ). The new agency, TCEQ, became effective September 1, 2002, as mandated under the State House Bill 2912 of the 77th Regular Legislative Session.

2.1 HRS DOCUMENTATION RECORD - OVERVIEW

Name of Site: San Jacinto River Waste Pits **Date Prepared**: 9/07

CERCLIS Site ID Number: TXN000606611

Site Specific Identifier: NONE

Street Address of Site: The site has no specific street address. The site is located on the western bank of the San Jacinto River, immediately north of the Interstate Highway 10 bridge (Ref. 4, p. 001).*

County, State, ZIP: Harris County, Texas, 77530

General Location in the State: The San Jacinto River Waste Pits site is located in Harris County (see Figure 1, Regional Location Map).

Topographic Map: US Geological Survey 7.5 Minute Topographic Map, Highlands Quadrangle. 1982 (Ref. 4, p. 001). See Ref. 4 for the center of the source area.

Latitude: 29.7944° N **Longitude: 95.0625° W**

EPA Region 6

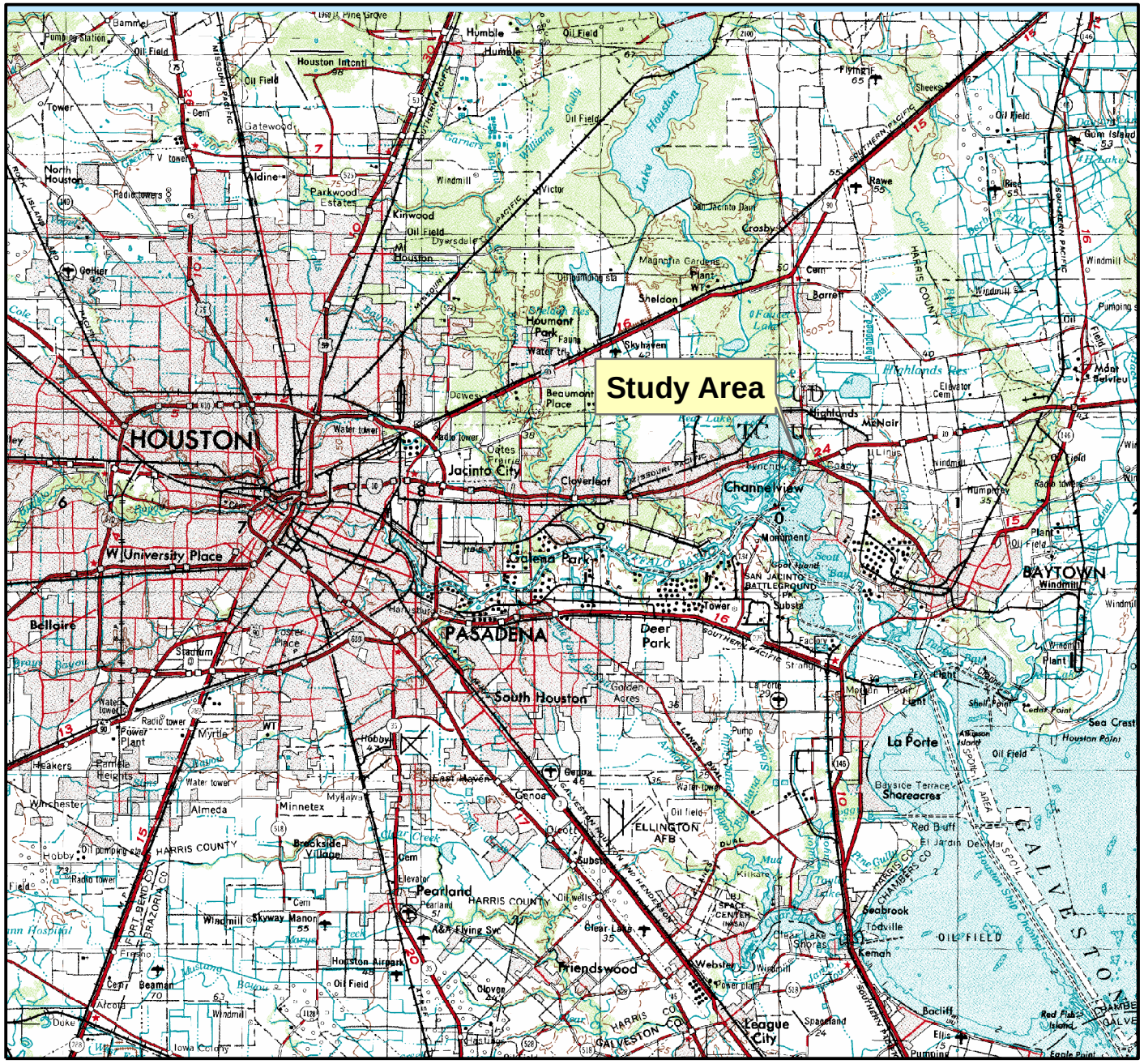
* *The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area in which the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists its national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. As site is defined as where a hazardous substance has been "deposited, stored, placed or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be defined as more information is developed as to where the contamination has come to be located.*

Pathway Scores:
Ground Water Migration Pathway.....NS
Surface Water Migration Pathway.....100.00
Soil Exposure Pathway ....NS
Air Migration Pathway ....NS

*NS = Not Scored - Pathways were evaluated but not scored due to their minimal contribution to the overall site score.

HRS SITE SCORE: 50.00

Figure 1 - Regional Location Map



SOURCE - The base data used is the Houston, TX 1:250,000 scale USGS Digital Raster Graphic (DRG). This DRG was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any raster data in this DRG. NAD 27 UTM Zone 15.

This map was generated by Marshall Cedilote of the TCEQ on July 12, 2007. This map was not generated by a licensed surveyor, and is intended for illustrative purposes only.

San Jacinto River Waste Pits
Harris County, Texas

EPA ID# TXN000606611

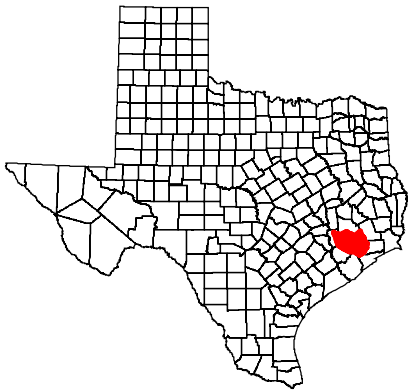


Figure 2 - San Jacinto River Waste Pits Location Map

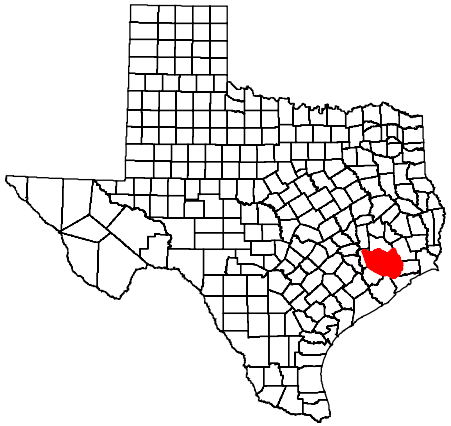
0 0.2 0.4 0.8 1.2 1.6
Miles

SOURCE - The base data used are the Highlands Digital Orthquarter Quadrangle (DOQQs). This DOQQ was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any data in this DOQQ.
NAD 27 UTM Zone 15.

This map was generated by Marshall Cedilote of the TCEQ on July 12, 2007. This map was not generated by a licensed surveyor, and is intended for illustrative purposes only.

San Jacinto River Waste Pits
Harris County, Texas

EPA ID# TXN000606611



WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S²
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13*)	NS	
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30*)	100	10,000
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28*)	NS	
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	100	10,000
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22*)	NS	
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12*)	NS	
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$	10,000	
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root.	**50.00**	

NS = Not Scored

* = Tables identified in the HRS Rule.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (HRS Table 4-1)

Factor Categories and Factors			Maximum Value	Value Assigned	
DRINKING WATER THREAT					
Likelihood of Release					
1.	Observed Release		550	550	
2.	Potential to Release by Overland Flow:				
	2a.	Containment	10	NS	
	2b.	Runoff	25	NS	
	2c.	Distance to Surface Water	25	NS	
	2d.	Potential to Release by Overland Flow			
		(Lines 2a x (2b + 2c))	500	NS	
3.	Potential to Release by Flood:				
	3a.	Containment (Flood)	10	NS	
	3b.	Flood Frequency	50	NS	
	3c.	Potential to Release by Flood			
		(Lines 3a x 3b)	500	NS	
4.	Potential to Release				
	(Lines 2d + 3c, subject to a maximum of 500)		500	NS	
5.	Likelihood of Release				
	(Higher of Lines 1 and 4)		550		550
Waste Characteristics					
6.	Toxicity/Persistence		*	NS	
7.	Hazardous Waste Quantity		*	NS	
8.	Waste Characteristics		100		NS
Targets					
9.	Nearest Intake		50	NS	
10.	Population:				
	10a.	Level I Concentrations	**	NS	
	10b.	Level II Concentrations	**	NS	

10c.	Potential Contamination	**	NS	
10d.	Population (Lines 10a + 10b + 10c)	**	NS	
11.	Resources	5	NS	
12.	Targets (Lines 9 + 10d + 11)	**		NS

Drinking Water Threat Score

13.	Drinking Water Threat Score ((Lines 5 x 8 x 12)/82,500, subject to a maximum of 100)	100		NS

HUMAN FOOD CHAIN THREAT

Likelihood of Release

14.	Likelihood of Release (Same value as Line 5)	550		550

Waste Characteristics

15.	Toxicity/Persistence/Bioaccumulation	*	5×10^8	
16.	Hazardous Waste Quantity	*	1×10^4	
17.	Waste Characteristics	1,000	1000	

Targets

18.	Food Chain Individual	50	20	
19.	Population:			
	19a. Level I Concentrations	**	NS	
	19b. Level II Concentration	**	NS	
	19c. Potential Human Food Chain Contamination	**	NS	
	19d. Population (Lines 19a + 19b + 19c)	**	NS	
20.	Targets			
	(Value from Lines 18 + 19d)	**		20

Human Food Chain Threat Score

21.	Human Food Chain Threat Score ((Lines 14 x 17 x 20)/82,500 subject to a maximum of 100)	100		100

ENVIRONMENTAL THREAT

Likelihood of Release

22.	Likelihood of Release (Same Value as Line 5)	550		550

Waste Characteristics

23.	Ecosystem Toxicity/Persistence/ Bioaccumulation	*	NS	
24.	Hazardous Waste Quantity	*	NS	

25.	Waste Characteristics	1,000	NS	
Targets				
26.	Sensitive Environments:			
	26a. Level I Concentrations	**	NS	
	26b. Level II Concentrations	**	NS	
	26c. Potential Contamination	**	NS	
	26d. Sensitive Environments			
	(Lines 26a + 26b + 26c)	**	NS	
27.	Targets (Value from Line 26d)	**		NS
Environmental Threat Score				
28.	Environmental Threat Score			
	((Lines 22 x 25 x 27)/82,500, subject to a maximum of 60)	60		NS
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED				
29.	WATERSHED SCORE***			
	(Lines 13 + 21 + 28, subject to a maximum of 100)	100		100.00
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE				
30.	Component Score (S_{of})*** (Highest score from Line 29 for all watersheds evaluated, subject to a maximum of 100)	100		100.00

* Maximum value applies to waste characteristics category
** Maximum value not applicable
*** Do not round to nearest integer
NS Not scored

REFERENCES

Number	Description of the Reference
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3.	U.S. Environmental Protection Agency, Superfund Chemical Data Matrix (SCDM). January 28, 2004. Excerpt pages: 35.
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5.	McKinney, Larry D., Ph.D. Texas Parks and Wildlife Department to Faith Hambleton, Texas Commission on Environmental Quality. RE: Dioxin in the San Jacinto River at the Interstate Highway-10 Bridge. April 14, 2005. 14 pages.
6.	ENSR Consulting and Engineering. Houston Ship Channel Toxicity Study Project Report. Document Number 1591R001.01. July 1995. 182 pages.
7.	Basnet, Saru, TCEQ. Photographs taken during San Jacinto River Waste Pits SSI. July 12-13, 2005. 8 pages.
8.	Marshall Cedilote, Record of Communication. Determination of Area of Impoundments. July 27, 2007. 1 page.
9.	University of Houston, Parsons Engineering, PBS&J. Total Maximum Daily Loads for Dioxins in the Houston Ship Channel. Quarterly Report No. 1. January 2004. 67 pages.
10.	Marshall Cedilote, Record of Communication. Collection of GPS Data. July 12, 2007. 1 page.
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12.	RESERVED
13.	RESERVED

14. Techlaw. Re: Contract #5823-49171 - Work Order 149-0016: Item 1.a. Historical Chain of Title Report; Items 6.a.1 and 6.a.2 Current Property Information for the San Jacinto Waste Pits site, Channelview, Harris County, Texas. July 7, 2005. 344 pages.

15. Aerial Viewpoint. Photograph of San Jacinto River Waste Pits area. November 18, 1956. 2 pages.

16. Aerial Viewpoint. Photograph of San Jacinto River Waste Pits area. October 8, 1964. 2 pages.

17. Aerial Viewpoint. Photograph of San Jacinto River Waste Pits area. February 15, 1973. 2 pages.

18. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. December 9, 1987. 2 pages.

19. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. December 13, 1989. 2 pages.

20. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. February 7, 1992. 2 pages.

21. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. April 3, 1998. 2 pages.

22. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. January 11, 1999. 2 pages.

23. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. May 20, 2002. 2 pages.

24. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. February 24, 1994. 2 pages.

25. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. January 15, 1995. 2 pages.

26. RESERVED

27. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. April 3, 1998. 2 pages.

28. RESERVED

29. RESERVED

30. RESERVED

31. Aerial Viewpoint. Photograph of the San Jacinto River Waste Pits area. February 4, 2003. 2 pages.

32. Aerial Viewpoint. Photograph of San Jacinto River Waste Pits area. April 24, 2005. 2 pages.

33. Letter to Marshall Cedilote, TCEQ, Catherine Sherman, TCEQ and William Warden, Harris County from Captain Jack Roberts. June 2, 2005. 4 pages.

34. Texas Department of State Health Services, Seafood and Aquatic Life Group, Policy, Standards, and Quality Assurance Unit and Regulatory Services Division. Characterization of Potential Health Risks Associated with Consumption of Fish or Blue Crabs from the Houston Ship Channel, the San Jacinto River (Tidal Portions), Tabbs Bay, and Upper Galveston Bay, Harris and Chambers Counties, Texas. January 10, 2005. 35 pages.

35. Texas Commission on Environmental Quality. Preliminary Assessment/Screening Site Inspection Work Plan for San Jacinto River Waste Pits, Houston, Harris County, Texas, TXN000606611. August 2005. 203 pages.

36. Texas Commission on Environmental Quality. Screening Site Inspection Report: San Jacinto River Waste Pits, Channelview, Harris County, Texas, TXN000606611. September 2006. Excerpt pages 1-51.

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38. U.S. Environmental Protection Agency, Region 6, Houston Branch. Case Number R605D02, Sample Delivery Group D02001, Dioxin Data Review / Revised Report. From: Marvelyn Humphrey, ESAT Regional PO, 6MD-HE, To: J. Rinehart, 6SF-RA. March 21, 2006. 137 pages.

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42. U.S. Geological Survey. La Porte Quadrangle, Texas, 7.5 Minute Series Topographic Map. 1982. 1 page.

43. U.S. Geological Survey. Morgans Point Quadrangle, Texas, 7.5 Minute Series Topographic Map. 1993. 1 page.

44. U.S. Geological Survey. League City Quadrangle, Texas, 7.5 Minute Series Topographic Map. 1982. 1 page.

45. U.S. Geological Survey. Bacliff Quadrangle, Texas, 7.5 Minute Series Topographic Map. 1993. 1 page.

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47. Website - http://www.tceq.state.tx.us/files/basin09-11-TrinSanJacBraz.pdf_4024826.pdf. Trinity-San Jacinto Coastal Basin (09), San Jacinto River Basin (10), San Jacinto-Brazos Coastal Basin (11), and Portion of Bays and Estuaries (24). Accessed on July 1, 2006. 2 pages.

48 Website - http://www.tceq.state.tx.us/files/basin24-BaysEstuaries-GulfMex.pdf_4027552.pdf. Bays and Estuaries (24) and Gulf of Mexico (25). Accessed on July 1, 2006. 2 pages.

49. Website - http://www.hcfcd.org/ME_sjrw.html. Harris County Flood Control District. San Jacinto River Watershed. Accessed on July 1, 2006. 2 pages.

50. Marshall Cedilote, Texas Commission on Environmental Quality. Field notes from June 1, 2005 reconnaissance of the San Jacinto River Waste Pits site. 1 page.

51. Marshall Cedilote, Texas Commission on Environmental Quality. Photographs taken during field reconnaissance on June 1, 2005. 10 pages.

52. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response (OSWER), OSWER Document 9240.1-48FS, EPA Publication 540-F-05-003. Multi-Media, Multi-Concentration Dioxin and Furan Analytical Service for Superfund (DLM02.0). September 2005. 4 pages.

53. University of Houston, Parsons Water & Infrastructure. Total Maximum Daily Loads for Dioxins in the Houston Ship Channel. Quarterly Report No. 3. July 2006. 221 pages. Page 20 modified by TCEQ on July 9, 2007 to show source area.

54. Website - http://www.epa.gov/history/topics/dioxin/01.htm. EPA to Regulate Dioxin in Paper Industry. Accessed on July 9, 2007. 3 pages.

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

2.2.1 Source Identification

- **Number of the source:** 1

- **Name and description of the source:** Surface Impoundment

Elevated concentrations of hazardous substances have been documented in the San Jacinto River Waste Pits (Ref. 38, pp. 012-018, 066, 073, 077, 084, 099, 106, 113, 134; also see Figure 3 in this HRS documentation record).

The San Jacinto River Waste Pits site was referred to the TCEQ by the Texas Parks & Wildlife Department (TPWD) on April 14, 2005 (Ref. 5, pp. 0001-0002). The phenomenon of unexplainably high dioxin concentrations in the area was initially identified in a July 1995 report of toxicity in the Houston Ship Channel (HSC) (Ref. 6, pp. 0022-0024). The TCEQ is currently conducting a Total Maximum Daily Load (TMDL) dioxin study of the HSC (Ref. 53, p. 011). Sediment, water, and fish and crab tissue samples collected in the vicinity of the impoundments show elevated levels of dioxins (Ref. 53, pp. 028-031, 061-063, 069-070, 098-105). The TMDL study sampling point nearest the San Jacinto River Waste Pits site is 11193 (Ref. 53, p. 020).

The site occupies a 20 acre tract of land currently owned by Virgil C. McGinnis* Trustee (Ref. 14, p. 011). The series of three impoundments were constructed sometime between October 8, 1964 (Ref. 16) and February 15, 1973 (Ref. 17). No information is available regarding details of construction of the impoundments. During a site reconnaissance performed on June 1, 2005 a berm was noted separating the impoundments (Ref. 51, p.005). See Figure 2 for the location of the San Jacinto River Waste Pits.

* Virgil C. McGinnis' last name is spelled differently in various references. Throughout this HRS documentation record the spelling "McGinnis" will be used.

Captain Jack Roberts stated that he had previously worked as a marine surveyor to inspect barges (Ref. 33, p. 001). He stated that he personally inspected vessels belonging to McGinnis Industries Maintenance Corp. (MIMC): Barge numbers 1, 2, 3, and 4, as well as the tugboats "Kingfish" and "Cyclops" (Ref. 33, p. 001). He stated that the tugboats pushed barges of waste sludge from the Champion Paper Co., Pasadena, Texas, to the pits for offloading and storage (Ref. 33, p. 001). He further stated that he has personally witnessed barges being loaded with sludge and discharged into the pits (Ref. 33, p. 001). Captain

Roberts also provided documentation that MIMC operated a "holding pond" for the storage of "stabilized waste water and rain water adjacent to Old River and Interstate Highway 10" (Ref. 33, p. 004).

The Texas Department of Health (TDH; now the Department of State Health Services) originally issued a fish consumption advisory in 1990 (ADV-3) for the Houston Ship Channel, including tidal portions of the San Jacinto River, where blue crabs and catfish were found contaminated with dioxin (Ref. 34, p. 002). On October 9, 2001, TDH augmented ADV-3 with ADV-20 which expanded the consumption advisory to cover blue crabs and all species of fish taken from the Houston Ship Channel, including tidal portions of the San Jacinto River (Ref. 34, p. 002). The advisory recommends that adults eat no more than one meal per month caught from the advisory area and suggests that women of childbearing age and children not consume any blue crabs or catfish from the advisory area (Ref. 34, p. 002). This consumption advisory was in effect in January 2005(Ref. 34, pp. 016-017).

- **Location of the source, with reference to a map:**

See Figure 2 for the location of the San Jacinto River Waste Pits.

- **Containment**

Gas release to air: The air migration pathway was not scored; therefore, gas containment was not evaluated.

Particulate release to air: The air migration pathway was not scored; therefore, particulate containment was not evaluated.

Release to ground water: The ground water pathway was not scored; therefore, ground water containment was not evaluated.

Release via overland migration and/or flood: The source is a series of three surface impoundments. The impoundments are inundated by the San Jacinto River (Ref. 18, p. 002; Ref. 19, p. 002; Ref. 20, p. 002; Ref. 21, p. 002; Ref. 22, p. 002; Ref. 23, p. 002; Ref. 27, p. 002; Ref. 31, p. 002; Ref. 32, p. 002). There is no containment to prevent the migration of hazardous substances from the surface impoundments. Therefore, a containment factor value of 10 is assigned (Ref. 1, Table 4-2, Section 4.1.2.1.2.1.1).

2.2.2 Hazardous Substances Associated With A Source

The surface impoundment source hazardous substances are those hazardous substances found in the source. The hazardous substances listed below in Table 1 were detected in samples collected by the TCEQ during the SSI sampling event tasked by the U.S. Environmental Protection Agency in July 2005 (Ref. 38, pp. 012-018, 066, 073, 077, 084, 099, 106, 113).

Table 1 presents the seven (7) individual sediment samples collected within the source area. For a list of hazardous substances that meet observed release criteria and their concentrations at each sample location, see Table 3.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
2,3,7,8-Tetrachlorodibenzo-p-dioxin	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
2,3,7,8-Tetrachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.
	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	**References**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.
	D02007 SE-03	Ref. 37, p. 010; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 073-076, 134-137.
	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,7,8-Pentachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
2,3,4,7,8-Pentachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,4,7,8-Hexachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 113-119, 134-137.
	D02007 SE-07	Ref. 37, p. 018; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 073-076, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	**References**
1,2,3,6,7,8-Hexachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
2,3,4,6,7,8-Hexachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,7,8,9-Hexachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,4,6,7,8-Heptachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Table 1 - Surface Impoundment Source Hazardous Substances

Hazardous Substance	Evidence	
	Sample Number	References
1,2,3,4,7,8,9-Heptachlorodibenzofuran	D02009 SE-04	Ref. 37, p. 012; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 084-090, 134-137.
	D02008 SE-05	Ref. 37, p. 014; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 077-083, 134-137.
	D02006 SE-08	Ref. 37, p. 020; Ref. 38, pp. 001-009, 022-029, 031, 041-042, 066-072, 134-137.
	D02012 SE-09	Ref. 37, p. 022; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 099-105, 134-137.
	D02013 SE-10	Ref. 37, p. 024; Ref. 38, pp. 001-009, 022-029, 030, 041-042, 106-112, 134-137.
	D02014 SE-11	Ref. 37, p. 026; Ref. 38, pp. 001-009, 022-029 030, 041-042, 113-119, 134-137.

Figure 3 - Source Sample Locations

SOURCE - The base data used are the Highlands Digital Orthoquarter Quadrangle (DOQQs). This DOQQ was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any data in this DOQQ.
NAD 27 UTM Zone 15.

This map was generated by Marshall Cedilote of the TCEQ on July 12, 2007. This map was not generated by a professional surveyor, and is intended for illustrative purposes only.

Geographic Positioning System (GPS) data was collected at the time and place of actual sample collection (Ref. 37, pp. 012, 018, 022, 024, 026; Ref. 10, p. 001).

San Jacinto River Waste Pits
Harris County, Texas

EPA ID# TXN000606611

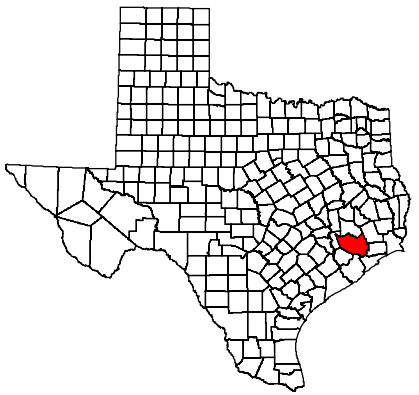

Table 2 – Sample Locations and Sample Numbers

Sample Number	Sample Location/Sample Depth	Date Collected	Reference
D02009	SE-04 Approx. 7feet below water surface	7/12/05	Refs. 7, p. 4 ; 37, p. 012; 38, p. 134
D02008	SE-05 Approx. 7-8 feet below water surface	7/12/05	Refs. 7, p. 2; 37, p. 014; 38, p. 134
D02007	SE-07 Approx. 5.5 feet below water surface	7/12/05	Refs. 7, p. 5; 37, p. 018; 38, p. 134
D02006	SE-08 Approx. 6 feet below water surface	7/12/05	Refs. 7, p. 5; 37, p. 020 ; 38, p. 134
D02012	SE-09	7/13/05	Refs. 37, p. 022; 38, p. 134
D02013	SE-10	7/13/05	Refs. 37, p. 024; 38, p. 134
D02014	SE-11	7/13/05	Refs. 37, p. 026; 38, p. 134
D02010	SE-02 Approx. 3.5 feet below water surface	7/13/05	Refs. 36, p. 23; 37, p. 008; 38, p. 134
D02011	SE-03 Approx. 3.5 feet below water surface	7/13/05	Refs. 36, p. 23; 37, p. 010; 38, p. 134
D02002	SE-19 Approx. 1 foot below water surface	7/12/05	Refs. 36, p. 23; 37, p. 042; 38, p. 134
D02003	SE-20 Approx. 1 foot below water surface	7/12/05	Refs. 36, p. 23; 37, p. 044; 38, p. 134

Table 3
Source 1 - Sample Results

Constituents	SE-04		SE-05		SE-07	
	Result (pg/g)	*CRQL or [EDL]* (pg/g)	Result (pg/g)	*CRQL or [EDL]* (pg/g)	Result (pg/g)	*CRQL or [EDL]* (pg/g)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	908.0	*1.0*	814	*1.0*	51.2	*1.0*
1,2,3,7,8-Pentachlorodibenzodioxin	12.4	*5.0*	9.74	*5.0*	1.16 LJ	*5.0*
1,2,3,4,7,8-Hexachlorodibenzodioxin	ND	*[2.43]*	ND	*[2.39]*	ND	*[2.48]*
1,2,3,6,7,8-Hexachlorodibenzodioxin	3.00	*5.0*	1.49 LJ	*5.0*	3.21	*5.0*
1,2,3,7,8,9-Hexachlorodibenzodioxin	3.94	*5.0*	1.50 LJ	*5.0*	4.87	*5.0*
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	128	*5.0*	43.8	*5.0*	147	*5.0*
2,3,7,8-Tetrachlorodibenzofuran	4210	*1.0*	3530	*1.0*	246	*1.0*
1,2,3,7,8-Pentachlorodibenzofuran	107	*5.0*	71.7	*5.0*	3.70	*5.0*
2,3,4,7,8-Pentachlorodibenzofuran	89.0	*5.0*	61.8	*5.0*	3.6	*5.0*
1,2,3,4,7,8-Hexachlorodibenzofuran	129	*5.0*	99.1	*5.0*	4.84	*5.0*
1,2,3,6,7,8-Hexachlorodibenzofuran	31.3	*5.0*	26.3	*5.0*	ND	*[2.48]*
2,3,4,6,7,8-Hexachlorodibenzofuran	7.15	*5.0*	5.09	*5.0*	ND	*[2.48]*
1,2,3,7,8,9-Hexachlorodibenzofuran	13.0	*5.0*	8.57	*5.0*	ND	*[2.48]*
1,2,3,4,6,7,8-Heptachlorodibenzofuran	39.8	*5.0*	26.2	*5.0*	ND	*[2.48]*
1,2,3,4,7,8,9-Heptachlorodibenzofuran	11.3	*5.0*	8.36	*5.0*	0.398 LJ	*5.0*
Reference	Ref. 38, pp. 001-009, 014-015, 031, 084-090, 135.	Ref. 38, p. 014; Ref 52, p. 2	Ref. 38, pp. 001-009, 014, 031, 077-083, 135.	Ref. 38, p. 014; Ref 52, p. 2	Ref. 38, pp. 001-009, 013, 031, 073-076, 135.	Ref. 38, p. 013; Ref 52, p. 2

pg/g = Picograms per gram
CRQL = Contract Required Quantitation Limit

EDL = Estimated Detection Limit. The sample specific EDL is an estimate made by the laboratory of the concentration of a given analyte that would have to be present to produce a signal with a peak height of less than 2.5 times (2.5x) the background noise level. The EDL is specific to a particular analysis of the sample and will be affected by sample size, dilution, etc.
ND = Undetected at the laboratory reported detection limit (IDL)
L = reported concentration is between the IDL and the CRQL.
J = Result is estimated

Table 3
Source 1 - Sample Results

Constituents	SE-08		SE-09		SE-10		SE-11	
	Result (pg/g)	*CRQL* (pg/g)	Result (pg/g)	*CRQL (pg/g)*	Result (pg/g)	*CRQL (pg/g)*	Result (pg/g)	*CRQL (pg/g)*
2,3,7,8-Tetrachlorodibenzo-p-dioxin	18500 J	*1.0*	5710	*1.0*	12900 J	*1.0*	17900 J	*1.0*
1,2,3,7,8-Pentachlorodibenzodioxin	182	*5.0*	363	*5.0*	349	*5.0*	323	*5.0*
1,2,3,4,7,8-Hexachlorodibenzodioxin	3.55	*5.0*	4.83	*5.0*	4.71	*5.0*	4.20	*5.0*
1,2,3,6,7,8-Hexachlorodibenzodioxin	11.0	*5.0*	27.9	*5.0*	26.9	*5.0*	15.9	*5.0*
1,2,3,7,8,9-Hexachlorodibenzodioxin	5.74	*5.0*	10.2	*5.0*	10.1	*5.0*	7.03	*5.0*
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	188	*5.0*	658	*5.0*	591	*5.0*	367	*5.0*
2,3,7,8-Tetrachlorodibenzofuran	41300 J	*1.0*	8430 J	*1.0*	20600 J	*1.0*	36700 J	*1.0*
1,2,3,7,8-Pentachlorodibenzofuran	1900	*5.0*	2400	*5.0*	3770	*5.0*	2710	*5.0*
2,3,4,7,8-Pentachlorodibenzofuran	1290	*5.0*	1480.0	*5.0*	2330	*5.0*	2030	*5.0*
1,2,3,4,7,8-Hexachlorodibenzofuran	5560	*5.0*	5220	*5.0*	8660	*5.0*	4940	*5.0*
1,2,3,6,7,8-Hexachlorodibenzofuran	1390.0	*5.0*	1360.0	*5.0*	2290	*5.0*	1270.0	*5.0*
2,3,4,6,7,8-Hexachlorodibenzofuran	222.0	*5.0*	229.0	*5.0*	349.0	*5.0*	216.0	*5.0*
1,2,3,7,8,9-Hexachlorodibenzofuran	440.0	*5.0*	451.0	*5.0*	656.0	*5.0*	403.0	*5.0*
1,2,3,4,6,7,8-Heptachlorodibenzofuran	962	*5.0*	1300.0	*5.0*	2360	*5.0*	1290	*5.0*
1,2,3,4,7,8,9-Heptachlorodibenzofuran	354	*5.0*	531.0	*5.0*	878.0	*5.0*	477	*5.0*
Reference	Ref. 38, pp. 001-009, 012-013, 031, 066-072, 135.	Ref 52, p. 2	Ref. 38, pp. 001-009, 016-, 030, 099-105, 136.	Ref 52, p. 2	Ref. 38, pp. 001-009, 017, 030, 106-112, 136.	Ref 52, p. 2	Ref. 38, pp. 001-009, 030, 017-018, 113-119, 136.	Ref 52, p. 2

pg/g = picograms per gram
CRQL = Contract Required Quantitation Limit
ND = Undetected at the laboratory reported detection limit (IDL)
L = reported concentration is between the IDL and the CRQL.
J = Result is estimated

Four (4) sediment samples collected during the SSI are used to establish background concentrations (Ref. 37, pp. 008, 010, 042, 044). Table 4 provides a summary of the background sample descriptions. Table 5 provides a summary of the background sample results.

Table 4 - Surface Water Migration Pathway
Background Sample Descriptions

Sample Location/Station Number	Date Collected	References
SE-02	7/13/05	Ref. 37, p. 008. Figure 4
SE-03	7/13/05	Ref. 37, p. 010. Figure 4
SE-19	7/12/05	Ref. 37, p. 042. Figure 4
SE-20 (Field Duplicate of SE-19)	7/12/05	Ref. 37, p. 042, 044. Figure 4

Table 5 - Background Sediment Sample Results

Sample Location/ Sample Number	Hazardous Substances	Sample Concentration (pg/g)	*CRQL or EDL* (pg/g)	References
D02010 SE-02	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.470	*1.0*	Refs. 37, p. 8; 38, pp. 001-009, 022-029, 091-094, 134, 136.
	1,2,3,7,8-Pentachlorodibenzodioxin	ND	*[0.115]*	
	1,2,3,4,7,8-Hexachlorodibenzodioxin	ND	*[2.35]*	
	1,2,3,6,7,8-Hexachlorodibenzodioxin	0.457 LJ	*5.0*	
	1,2,3,7,8,9-Hexachlorodibenzodioxin	0.581 LJ	*5.0*	
	1,2,3,4,6,7,8-Heptachlorodibenzodioxin	15.8	*5.0*	
	2,3,7,8-Tetrachlorodibenzofuran	1.11	*1.0*	
	1,2,3,7,8-Pentachlorodibenzofuran	ND	*[2.35]*	
	2,3,4,7,8-Pentachlorodibenzofuran	ND	*[2.35]*	
	1,2,3,4,7,8-Hexachlorodibenzofuran	ND	*[2.35]*	
	1,2,3,6,7,8-Hexachlorodibenzofuran	ND	*[2.35]*	
	2,3,4,6,7,8-Hexachlorodibenzofuran	ND	*[2.35]*	
	1,2,3,7,8,9-Hexachlorodibenzofuran	ND	*[1.30]*	
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	ND	*[2.35]*	
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.122 LJ	*5.0*	

Sample Location/Station Number	Table 5 - Background Samples			
	Hazardous Substances	**Sample Concentration (pg/g)**	***CRQL or [EDL]* (pg/g)**	**References**
D02011 SE-03	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.920	*1.0*	Refs. 37, p. 10; 38, pp. 001-009, 022-029, 095-098, 134, 136.
	1,2,3,7,8-Pentachlorodibenzodioxin	0.196 LJ	*5.0*	
	1,2,3,4,7,8-Hexachlorodibenzodioxin	ND	*[2.43]*	
	1,2,3,6,7,8-Hexachlorodibenzodioxin	0.844 LJ	*5.0*	
	1,2,3,7,8,9-Hexachlorodibenzodioxin	0.980 LJ	*5.0*	
	1,2,3,4,6,7,8-Heptachlorodibenzodioxin	27.9	*5.0*	
	2,3,7,8-Tetrachlorodibenzofuran	1.60	*1.0*	
	1,2,3,7,8-Pentachlorodibenzofuran	ND	*[2.43]*	
	2,3,4,7,8-Pentachlorodibenzofuran	ND	*[2.43]*	
	1,2,3,4,7,8-Hexachlorodibenzofuran	ND	*[2.43]*	
	1,2,3,6,7,8-Hexachlorodibenzofuran	ND	*[2.43]*	
	2,3,4,6,7,8-Hexachlorodibenzofuran	ND	*[2.43]*	
	1,2,3,7,8,9-Hexachlorodibenzofuran	ND	*[2.43]*	
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.24 LJ	*5.0*	
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.281 LJ	*5.0*	

Sample Location/ Station Number	Table 5 - Background Samples			
	Hazardous Substances	**Sample Concentration (pg/g)**	***CRQL or [EDL]* (pg/g)**	**References**
D02002 SE-19	2,3,7,8-Tetrachlorodibenzo-p-dioxin	ND	*[0.280]*	Refs. 37, p. 10; 38, pp. 001-009, 022-029, 052-055, 134-135.
	1,2,3,7,8-Pentachlorodibenzodioxin	0.263 LJ	*5.0*	
	1,2,3,4,7,8-Hexachlorodibenzodioxin	ND	*[2.40]*	
	1,2,3,6,7,8-Hexachlorodibenzodioxin	0.192 LJ	*5.0*	
	1,2,3,7,8,9-Hexachlorodibenzodioxin	0.234 LJ	*5.0*	
	1,2,3,4,6,7,8-Heptachlorodibenzodioxin	ND	*[2.40]*	
	2,3,7,8-Tetrachlorodibenzofuran	0.500	*1.0*	
	1,2,3,7,8-Pentachlorodibenzofuran	ND	*[2.40]*	
	2,3,4,7,8-Pentachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,4,7,8-Hexachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,6,7,8-Hexachlorodibenzofuran	ND	*[2.40]*	
	2,3,4,6,7,8-Hexachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,7,8,9-Hexachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.343 LJ	*5.0*	

Sample Location/Sample Number	Table 5 - Background Samples			
	Hazardous Substances	**Sample Concentration (pg/g)**	***CRQL or [EDL]* (pg/g)**	**References**
D02003 SE-20	2,3,7,8-Tetrachlorodibenzo-p-dioxin	ND	*[0.210]*	Refs. 37, p. 44; 38, pp. 001-009, 022-029, 056-058, 134-135.
	1,2,3,7,8-Pentachlorodibenzodioxin	ND	*[0.0968]*	
	1,2,3,4,7,8-Hexachlorodibenzodioxin	ND	*[2.40]*	
	1,2,3,6,7,8-Hexachlorodibenzodioxin	0.106 LJ	*5.0*	
	1,2,3,7,8,9-Hexachlorodibenzodioxin	0.140 LJ	*5.0*	
	1,2,3,4,6,7,8-Heptachlorodibenzodioxin	ND	*[2.40]*	
	2,3,7,8-Tetrachlorodibenzofuran	ND	*[0.48]*	
	1,2,3,7,8-Pentachlorodibenzofuran	ND	*[2.40]*	
	2,3,4,7,8-Pentachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,4,7,8-Hexachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,6,7,8-Hexachlorodibenzofuran	ND	*[2.40]*	
	2,3,4,6,7,8-Hexachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,7,8,9-Hexachlorodibenzofuran	ND	*[2.40]*	
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.67	*5.0*	
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.29 LJ	*5.0*	

EDL = Estimated Detection Limit. The sample specific EDL is an estimate made by the laboratory of the concentration of a given analyte that would have to be present to produce a signal with a peak height of less than 2.5 times (2.5x) the background noise level. The EDL is specific to a particular analysis of the sample and will be affected by sample size, dilution, etc.
pg/g = picograms per gram
CRQL = Contract Required Quantitation Limit
ND = Undetected at the laboratory reported detection limit (IDL)
L = reported concentration is between the IDL and the CRQL.
J = Result is estimated

All source and background samples are comparable in terms of collection date (Ref. 37, pp. 008, 010, 012, 014, 018, 020, 022, 024, 026, 042, 044), type of analysis (Ref. 38, pp. 010-018, 052-119, 135-136), and sample type (Ref. 36, pp. 014, 045). All samples were collected from a depth no greater than 30 inches below the surface of the sediment (Ref. 7).

All samples were collected according to the EPA approved, FY 2004-2005 TCEQ Quality Assurance Project Plan (Refs. 36, p. 14; 39, p. 032).

Source samples are being compared to background samples since the impoundments are inundated by the San Jacinto River (Ref. 18, p. 002; Ref. 19, p. 002; Ref. 20, p. 002; Ref. 21, p. 002; Ref. 22, p. 002; Ref. 23, p. 002; Ref. 27, p. 002; Ref. 31, p. 002; Ref. 32, p. 002) and the contents are in contact with river water and sediment. There may be some mixing of river sediments with waste in the impoundments. Therefore, comparison to background concentrations is a conservative approach.

Figure 4 - Background Sediment Sample Locations

0 0.4 0.8 1.6 2.4 3.2

Miles

SOURCE - The base data used are the Highlands and La Porte Digital Orthoquarter Quadrangles (DOQQs).This DOQQ was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any digital data in this DOQQ. NAD 83 UTM Zone 15

This map was generated by Marshall Cedilote of the TCEQ On July 12, 2007. This map was not generated by a licensed surveyor, and is intended for illustrative purposes only.

Geographic positioning System (GPS) data was collected at the time and place of actual sample collection (Ref. 37, pp. 008, 010, 042, 044; Ref. 10, p. 001).

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2.2.3 Hazardous Substances Available to a Pathway

Because the containment factor value for Source 1 is greater than 0 (Ref. 18, p. 002; Ref. 19, p. 002; Ref. 20, p. 002; Ref. 21, p. 002; Ref. 22, p. 002; Ref. 23, p. 002; Ref. 27, p. 002; Ref. 31, p. 002; Ref. 32, p. 002), the following hazardous substances associated with Source 1 can migrate via the Surface Water Migration Pathway:

2,3,7,8-Tetrachlorodibenzo-p-dioxin
1,2,3,7,8-Pentachlorodibenzodioxin
1,2,3,4,7,8-Hexachlorodibenzodioxin
1,2,3,6,7,8-Hexachlorodibenzodioxin
1,2,3,7,8,9-Hexachlorodibenzodioxin
1,2,3,4,6,7,8-Heptachlorodibenzodioxin
2,3,7,8-Tetrachlorodibenzofuran
1,2,3,7,8-Pentachlorodibenzofuran
2,3,4,7,8-Pentachlorodibenzofuran
1,2,3,4,7,8-Hexachlorodibenzofuran
1,2,3,6,7,8-Hexachlorodibenzofuran
2,3,4,6,7,8-Hexachlorodibenzofuran
1,2,3,7,8,9-Hexachlorodibenzofuran
1,2,3,4,6,7,8-Heptachlorodibenzofuran
1,2,3,4,7,8,9-Heptachlorodibenzofuran

2.3 LIKELIHOOD OF RELEASE

As demonstrated in Tables 1-5 of this HRS documentation record, an observed release to the Surface Water Migration Pathway has been established based on direct observation. The impoundments are inundated by the San Jacinto River and the contents are in direct contact with the river water (Refs. 15-23, p. 2; 31-32, p. 2). Sediment samples collected within the surface impoundments indicate that concentrations of hazardous substances are present at levels significantly greater than upstream and downstream background levels and in concentrations greater than the corresponding CRQLs. An observed release by chemical analysis is also documented (see Section 4.1.3.1 of this HRS documentation record).

Refer to Section 4.1.3.1 of this HRS documentation record for specific information related to the release to the Surface Water Migration Pathway.

2.4 WASTE CHARACTERISTICS

2.4.1 Selection of Substance Potentially Posing Greatest Hazard

Waste characteristic values for hazardous substances found in an observed release to surface water were derived from SCDM (Ref. 3).

Specific factors of the hazardous substances available to the Surface Water Migration Pathway and selection of the hazardous substance with the highest combined toxicity/persistence/bioaccumulation factor value are presented under the Surface Water Migration Pathway section (Section 4.1.3.2.1) of this HRS documentation record.

2.4.2 Hazardous Waste Quantity

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity (Tier A) - Not Scored (NS)

The information available is not sufficient to evaluate Tier A as required in Section 2.4.2.1.1 of the HRS Rule. As a result, the evaluation of Hazardous Waste Quantity proceeds to evaluation of Tier B, Hazardous Wastestream Quantity (Ref.1, Section 2.4.2.1.1).

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B) - NS

The information available is not sufficient to evaluate Tier B as required in Section 2.4.2.1.2 of the HRS Rule. As a result, the evaluation of Hazardous Waste Quantity proceeds to the evaluation of Tier C, Volume (Ref. 1, Section 2.4.2.1.2).

2.4.2.1.3 Volume (Tier C) - 0

The information available is not sufficient to evaluate Tier C as required by Section 2.4.2.1.3 of the HRS Rule. As a result, the evaluation of Hazardous Waste Quantity proceeds to evaluation of Tier D, Area (Ref. 1, Section 2.4.2.1.3).

2.4.2.1.4 Area (Tier D)

The surface impoundments have a surface area of approximately 367,209 square feet. See Figure 5.

Figure 5 - Calculation of Source Area

0 0.02 0.04 0.08 0.12 0.16 Miles

TCEQ

SOURCE - The base data used in this map is a digital version of a February 15, 1973 aerial photograph of the source area. Negative frame 14-13. This aerial photograph was obtained by the TCEQ from Aerial Viewpoint, P.O. Box 12289, Spring, Texas 77391-2289, (281) 370-7502 (Ref. 17). UTM NAD83 Zone 15

This map was generated by Marshall Cedilote of the TCEQ on July 12, 2007. This map was not generated by a licensed surveyor.

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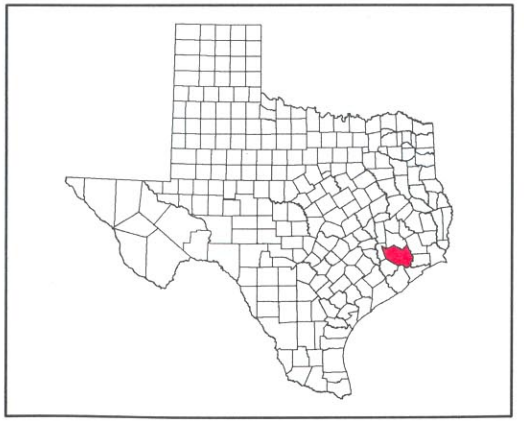
Area of "A" = 132,386 square feet

Area of "B" = 46,182 square feet

Area of "C" = 188,641 square feet

TOTAL AREA = 367,209 square feet*

*** Total area was calculated in ArcGIS 9.1 (Ref. 8, p. 001)**



2.4.2.1.5 Source Hazardous Waste Quantity Value (from HRS Rule, Table 2-5)

= 367,209 ft^2/13 (for surface impoundment)

= 28,246.85

Table 6 - Source 1 Hazardous Waste Quantity	
Tier Measure	**Surface Water Migration Pathway**
Tier A, Constituent Quantity	NS
Tier B, Wastestream Quantity	NS
Tier C, Volume	0
Tier D, Area	28,246.85

NS = Not Scored

2.4.2.2 Calculation of Hazardous Waste Quantity Factor Value (from HRS Rule, Table 2-6)

Hazardous Waste Quantity Value Greater than 10,000 to 1,000,000:
Assigned value is 10,000.

Hazardous Waste Quantity Factor Value: 1 x 10^4

SITE SUMMARY OF SOURCE DESCRIPTIONS

Table 7
Site Summary of Source Descriptions

Source Number	Source Hazardous Waste Quantity Factor Value	Containment			
		Ground Water	Surface Water	Gas	Air Particulate
1	28,246.85	NS	10	NS	NS

NS = Not Scored

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

The ground water pathway was evaluated but not included due to a lack of an observed release and the pathway's minimal contribution to the overall site score.

4.0 SURFACE WATER MIGRATION PATHWAY

4.0.1 Migration Components

The Surface Water Migration Pathway's Overland/Flood Migration to Surface Water Component will be evaluated in lieu of the Ground Water to Surface Water Migration Components, since it will result in the higher of the two component scores.

4.0.2 Surface Water Categories

Rivers: According to the HRS Rule, rivers include: Perennially flowing waters from point of origin to the ocean or to coastal tidal waters, whichever comes first, and wetlands contiguous to these flowing waters; aboveground portions of disappearing rivers; manmade ditches only insofar as they perennially flow into other surface water; and intermittently flowing waters and contiguous intermittently flowing ditches only in arid or semiarid areas with less than 20 inches of mean annual precipitation (Ref. 1, Section 4.0.2). Rivers is the surface water body category classified within the 15 mile target distance limit (TDL) of the San Jacinto River Waste Pits site. (Ref. 4, p. 001). See Figure 6.

4.1 Overland/Flood Migration Component

4.1.1 General Considerations

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Migration Component

General Considerations

The San Jacinto River Waste Pits site lies within the San Jacinto River Watershed (Ref. 49, p. 001). The San Jacinto River Waste Pits lie within the State of Texas Water Quality Segment 1001 of the San Jacinto River Basin (Ref. 47, p. 001). Water from 1001 will drain into State of Texas Water Quality Segment 1005 of the San Jacinto River basin (Ref. 47, p. 001), thence into State of Texas Water Quality Segments 2426, 2430, 2429, 2428, 2427, 2436, and 2421 of the Bays and Estuaries (Upper Galveston Bay) to the end of the 15-mile TDL (Ref. 48, p. 001). The San Jacinto River in the site area is tidally influenced (Ref. 47, pp. 001-002). This tidal influence has had little effect on the transport of source related contaminants upstream of the impoundments (See Table 5).

Definition of Overland Segments and Probable Point of Entry (PPE)

The Probable Point of Entry (PPE) is the area of the impoundments in contact with surface water.

4.1.1.2 Target Distance Limit

The TDL for this site is comprised of three Hazard Ranking System (HRS) In-Water Segments, which are included within nine (9) State of Texas Water Quality Segments. The components of these HRS In-Water segments are discussed below.

In-Water Segment 1: San Jacinto River, approximately 2.4 miles.

In-Water Segment 1 of the TDL is defined as the in-water distance from the PPE extending to the confluence of the San Jacinto River with the Houston Ship Channel, approximately 2.4 miles (Ref. 4). See Figure 6.

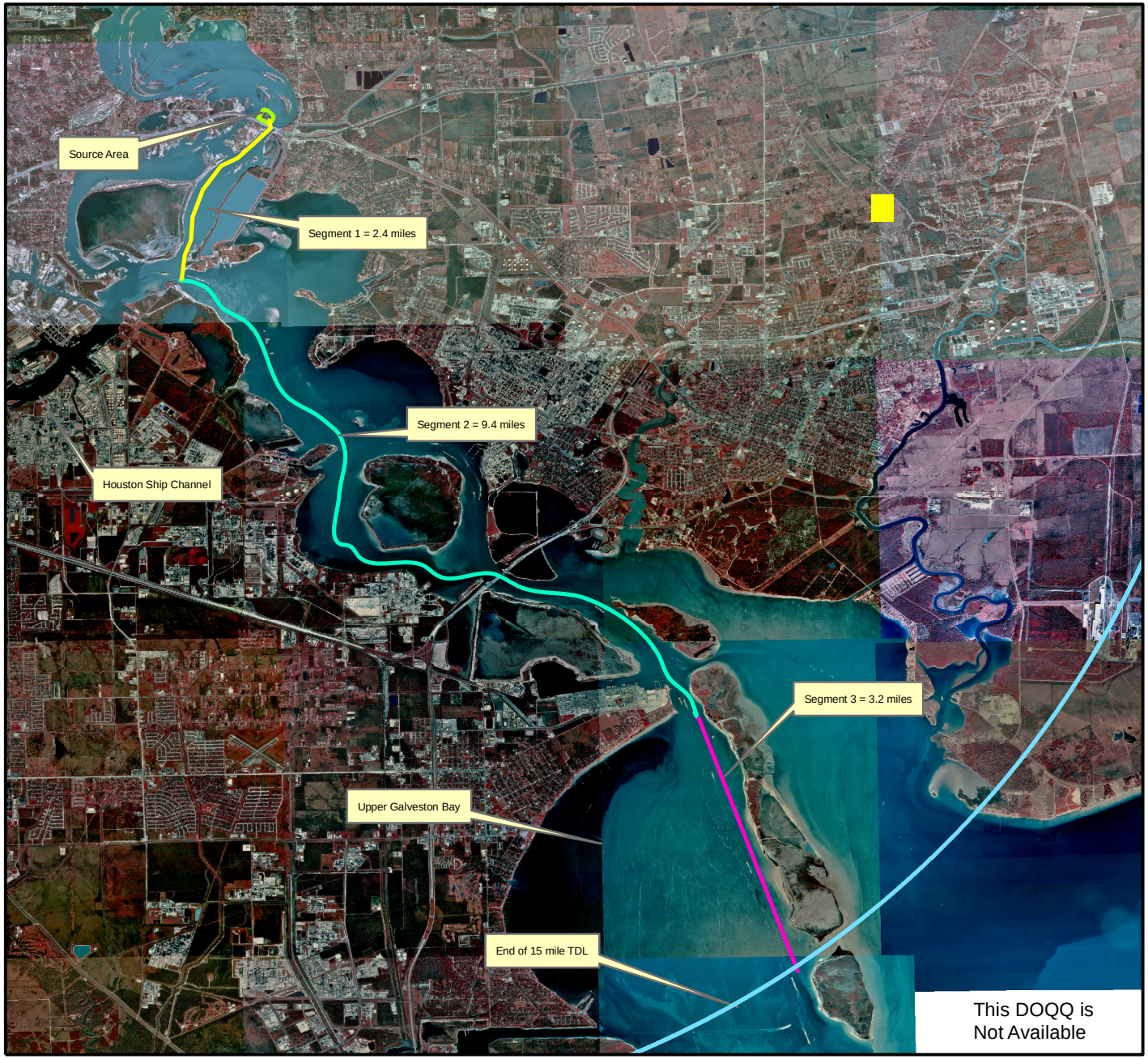
In-Water Segment 2: San Jacinto River, approximately 9.4 miles.

In-Water Segment 2 of the TDL is defined as the in-water distance from the San Jacinto River's confluence with the Houston Ship Channel to its confluence with Upper Galveston Bay, approximately 9.4 miles (Refs. 4, 42, 43). See Figure 6.

In-Water Segment 3: Upper Galveston Bay, approximately 3.2 miles.

In-Water Segment 3 of the TDL is defined as the in-water distance from the confluence of the San Jacinto River with Upper Galveston Bay to the end of the TDL, approximately 3.2 miles (Refs. 43-46). See Figure 6.

Figure 6 - All Segments of 15-Mile Target Distance Limit



0 1 2 4 6 8 Miles

TCEQ

SOURCE - The base data used are the Highlands, Monte Belvue, La Porte, Morgan's Point, League City, Bacliff, and Friendswood Digital Orthoquarter Quadrangles (DOQQs). These DOQQs were obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any digital data in this DOQQ. NAD 83 UTM Zone 15

This map was generated by Marshall Cedilote of the TCEQ on July 12, 2007. This map was not generated by a licensed surveyor, and is intended for illustrative purposes only.

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4.1.1.3 Evaluation of Overland/Flood Migration Component

As described in the HRS Rule, Section 4.1.1.3, since there is only one watershed area, the resulting score for that watershed will become the overland/flood migration component score for the site. Per HRS Section 4.1.1.3, the overland/flood migration component is evaluated for the drinking water threat, human food chain threat, and environmental threat for each watershed. There were no identified drinking water targets located within the defined TDL. Additionally, environmental targets were identified but the environmental threat was not scored, as inclusion of this threat would not contribute to the site score. Therefore, the overland/flood migration component will only be evaluated for the human food chain threat, based on three factor categories: likelihood of release, waste characteristics, and targets. The resulting Overland/Flood Migration pathway score will be used to evaluate the Surface Water Migration Pathway score (Ref. 1, Section 4.1.1.3).

4.1.2 Drinking Water Threat

The drinking water threat was evaluated but not scored due to a lack of drinking water targets located along the overland/flood migration pathway within the identified TDL.

4.1.3 Human Food Chain Threat

As described in the HRS Rule, the human food chain threat for the watershed of concern will be evaluated based on three factor categories: Likelihood of release, waste characteristics and targets (Ref. 1, Section 4.1.3).

4.1.3.1 Likelihood of Release

A release of a hazardous substance to the surface water pathway has been documented by direct observation and by chemical analysis (see Figure 3 and Tables 3, 9, and 10 in this HRS documentation record; Refs. 18-23, p. 002; 27, p. 002; 31-32, p. 002).

Likelihood of Release Value = 550

4.1.3.1.1 Observed Release

An observed release to a qualifying surface water body can be documented in the HRS by two methods: a) direct observation and b) chemical analysis (Ref. 1, Section 2.3). Both methods were used for this report.

Observed Release by Direct Observation

Establishing an observed release by direct observation generally only requires information that a material containing a hazardous substance attributable to the site was placed into or seen entering the medium of concern (Ref. 2, p. 063). Attribution in this case generally involves documenting that the substance in the release is associated with the site, either with sampling or non-sampling data (Ref. 2, p. 063).

In the Surface Water Migration Pathway, establishing an observed release by direct observation generally requires information that:

"Material containing a hazardous substance has been seen entering surface water through migration or direct deposition;

"A source has been flooded at a time that a hazardous substance was present in the source, and material containing a hazardous substance was in direct contact with surface water; or

"Information documenting adverse affects associated with a release of a hazardous substance to surface water (e.g., a fish kill incident) supports the inference of a release of material containing that hazardous substance from the site to surface water" (Refs. 1, Secs. 4.1.3.1, 4.1.2.1.1; 2, p. 064).

The impoundments, containing dioxins and furans, are inundated by the San Jacinto River and the contents are in direct contact with the river water (Refs. 18-23, p. 2; 27, p. 2; 31-32, p. 2; 51, pp. 001-003, 006).

Observed Release by Chemical Analysis

An observed release by chemical analysis is also presented as a conservative approach.

Background Concentrations

Four (4) sediment samples are used to establish background concentrations (Ref. 37; pp. 008, 010, 042, 044). Table 8 provides a summary of the background samples. Table 9 presents the highest designated background levels for dioxin and dioxin-like hazardous substances of concern for this site, for use with comparison to San Jacinto River target sediment samples. All sediment samples were collected using a sediment coring device with a zero contamination tube (Ref. 36, p. 045).

Table 8

Surface Water Pathway - Summary of Background Sediment Samples

Sample Number	Sample Location	Date Collected	Location Reference
SE-02 D02010	Upstream in San Jacinto River	7/13/05	Refs. 36, p. 023; 37, p. 008; 38, p. 134
SE-03 D02011	Upstream in San Jacinto River	7/13/05	Refs. 36, p. 023; 37, p. 010; 38, p. 134
SE-19 D02002	Downstream in San Jacinto River	7/12/05	Refs. 36, p. 023; 37, p. 042; 38, p. 134
SE-20 D02003	Downstream in San Jacinto River	7/12/05	Refs. 36, p. 023; 37, p. 044; 38, p. 134

All sediment samples were collected according to the EPA approved state Quality Assurance Project Plan (Refs. 36, p. 14; 39, p. 032).

Table 9
Summary of Highest Detections in Background Samples

Constituent	Sample Number	Highest Concentration (pg/g) [EDL]	Comparison Concentration	Reference
2,3,7,8-Tetrachlorodibenzo-p-dioxin	SE-03	0.920	2.76	Refs. 37, p. 10; 38, pp. 001-009, 015, 022-029, 095, 134, 136.
1,2,3,7,8-Pentachlorodibenzodioxin	SE-19	0.263 LJ	0.789	Refs. 37, p. 42; 38, pp. 001-010, 022-029, 052, 134-135.
1,2,3,4,7,8-Hexachlorodibenzodioxin	SE-20	[2.40]	2.40	Refs. 37, p. 44; 38, pp. 001-009, 011, 022-029, 056, 134-135.
1,2,3,6,7,8-Hexachlorodibenzodioxin	SE-03	0.844 LJ	2.53	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
1,2,3,7,8,9-Hexachlorodibenzodioxin	SE-03	0.980 LJ	2.94	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	SE-03	27.9	83.7	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
2,3,7,8-Tetrachlorodibenzofuran	SE-03	1.60	4.8	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
1,2,3,7,8-Pentachlorodibenzofuran	SE-19	[2.40]	2.40	Refs. 37, p. 42; 38, pp. 001-010, 022-029, 052, 134-135.

Table 9 Summary of Highest Detections in Background Samples				
Constituent	**Sample Number**	**Highest Concentration (pg/g) [EDL]**	**Comparison Concentration**	**Reference**
2,3,4,7,8-Pentachlorodibenzofuran	SE-03	[2.43]	2.43	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
1,2,3,4,7,8-Hexachlorodibenzofuran	SE-19	[2.40]	2.40	Refs. 37, p. 42; 38, pp. 001-010, 022-029, 052, 134-135.
1,2,3,6,7,8-Hexachlorodibenzofuran	SE-19	[2.40]	2.40	Refs. 37, p. 42; 38, pp. 001-010, 022-029, 052, 134-135.
2,3,4,6,7,8-Hexachlorodibenzofuran	SE-03	[2.43]	2.43	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
1,2,3,7,8,9-Hexachlorodibenzofuran	SE-03	[2.43]	2.43	Refs. 37, p. 10; 38, pp. 001-009, 016, 022-029, 095, 134, 136.
1,2,3,4,6,7,8-Heptachlorodibenzofuran	SE-20	4.67	14.01	Refs. 37, p. 44; 38, pp. 001-009, 011, 022-029, 056, 134-135.
1,2,3,4,7,8,9-Heptachlorodibenzofuran	SE-20	1.29 LJ	3.87	Refs. 37, p. 44; 38, pp. 001-009, 011, 022-029, 056, 134-135.

pg/g = picograms per gram
EDL = estimated detection limit

Table 10
Observed Release Samples

Constituents	SE-04		SE-05		SE-07		SE-08	
	Result (pg/g)	*CRQL or [EDL]* (pg/g)	Result (pg/g)	*CRQL or [EDL]* (pg/g)	Result (pg/g)	*CRQL or [EDL]* (pg/g)	Result (pg/g)	*CRQL or [EDL]* (pg/g)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	908.0	*1.0*	814	*1.0*	51.2	1.0	18500 J	*1.0*
1,2,3,7,8-Pentachlorodibenzodioxin	12.4	*5.0*	9.74	*5.0*	1.16 LJ	5.0	182	*5.0*
1,2,3,4,7,8-Hexachlorodibenzodioxin							3.55	*5.0*
1,2,3,6,7,8-Hexachlorodibenzodioxin	3.00	*5.0*			3.21	5.0	11.0	*5.0*
1,2,3,7,8,9-Hexachlorodibenzodioxin	3.94	*5.0*			4.87	5.0	5.74	*5.0*
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	128	*5.0*			147	5.0	188	*5.0*
2,3,7,8-Tetrachlorodibenzofuran	4210	*1.0*	3530	*1.0*	246	1.0	41300 J	*1.0*
1,2,3,7,8-Pentachlorodibenzofuran	107	*5.0*	71.7	*5.0*	3.70	5.0	1900	*5.0*
2,3,4,7,8-Pentachlorodibenzofuran	89.0	*5.0*	61.8	*5.0*	3.6	5.0	1290	*5.0*
1,2,3,4,7,8-Hexachlorodibenzofuran	129	*5.0*	99.1	*5.0*	4.84	5.0	5560	*5.0*
1,2,3,6,7,8-Hexachlorodibenzofuran	31.3	*5.0*	26.3	*5.0*			1390.0	*5.0*
2,3,4,6,7,8-Hexachlorodibenzofuran	7.15	*5.0*	5.09	*5.0*			222.0	*5.0*
1,2,3,7,8,9-Hexachlorodibenzofuran	13.0	*5.0*	8.57	*5.0*			440.0	*5.0*
1,2,3,4,6,7,8-Heptachlorodibenzofuran	39.8	*5.0*	26.2	*5.0*			962	*5.0*
1,2,3,4,7,8,9-Heptachlorodibenzofuran	11.3	*5.0*	8.36	*5.0*			354	*5.0*
References	Ref. 38, pp. 001-009, 014-015, 031, 084-090, 135	Ref. 38, p. 014; Ref 52, p. 2	Ref. 38, pp. 001-009, 014, 031, 077-083, 135	Ref. 38, p. 014; Ref 52, p. 2	Ref. 38, pp. 001-009, 013, 031, 073-076, 135	Ref. 38, p. 013; Ref 52, p. 2	Ref. 38, pp. 001-009, 012-013, 031, 066-072, 135	Ref. 52, p. 2

Hazardous Substances Released

When compared to background levels the following hazardous substances have been released (Ref. 1, Section 2.3):

2,3,7,8-Tetrachlorodibenzo-p-dioxin
1,2,3,7,8-Pentachlorodibenzodioxin
1,2,3,4,7,8-Hexachlorodibenzodioxin
1,2,3,6,7,8-Hexachlorodibenzodioxin
1,2,3,7,8,9-Hexachlorodibenzodioxin
1,2,3,4,6,7,8-Heptachlorodibenzodioxin
2,3,7,8-Tetrachlorodibenzofuran
1,2,3,7,8-Pentachlorodibenzofuran
2,3,4,7,8-Pentachlorodibenzofuran
1,2,3,4,7,8-Hexachlorodibenzofuran
1,2,3,6,7,8-Hexachlorodibenzofuran
2,3,4,6,7,8-Hexachlorodibenzofuran
1,2,3,7,8,9-Hexachlorodibenzofuran
1,2,3,4,6,7,8-Heptachlorodibenzofuran
1,2,3,4,7,8,9-Heptachlorodibenzofuran

Attribution

Dioxin is a contaminant associated with pulp and paper mill waste (Ref. 54, p. 001). Numerous dioxin and dioxin-like hazardous substances have been documented in Source No. 1 – Surface Impoundments (Ref. 38, pp. 001-009, 034-036, 012-018, 066-090, 099-119). Source No. 1 is inundated by the San Jacinto River and the contents are in direct contact with the river water (Ref. 51, pp. 001-003, 006; Ref. 18, p. 002; Ref. 19, p. 002; Ref. 20, p. 002; Ref. 21, p. 002; Ref. 22, p. 002; Ref. 23, p. 002; Ref. 24, p. 002; Ref. 25, p.002). Thus, Source No. 1 has a containment value >0 and these hazardous substances are available to migrate to the surface water pathway as described in the HRS Rule, Section 2.2.3.

Historical sediment, water and tissue samples collected in the vicinity of the impoundments have documented high levels of dioxin and dioxin-like hazardous substances (Ref. 53, pp. 028-031, 061-063, 069-070, 098-105).

A July 29, 1966 letter from the Texas Water Pollution Control Board to the McGinnis Industries Maintenance Corp. (MIMC) indicates that the impoundments were used for storage of wastewater (Ref. 33, p. 004). Captain Jack Roberts stated that he personally witnessed barges being loaded with waste sludge from a pulp papermill and that he personally witnessed the same barges being offloaded into the impoundments (Ref. 33, p. 001).

The impoundments were constructed between October 8, 1964 (Ref. 16) and February 15, 1973 (Ref. 17). This date is consistent with the approximate date of construction and MIMC's inquiry regarding discharging wastewater from the impoundments in 1966 (Ref. 33, p. 4). Virgil McGinnis purchased the site on August 3, 1965 (Ref. 14, pp. 020, 026, 081, 085). Historical aerial photographs (Refs. 15-18) clearly show that the impoundments are manmade.

4.1.3.2 Human Food Chain Threat Waste Characteristics

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

The following Human Food Chain Toxicity, Persistence and Bioaccumulation Potential Factor Values have been assigned to the hazardous substances attributable to and detected in the onsite sources.

Table 11
Surface Water Pathway - Hazardous Substance Toxicity, Persistence and Bioaccumulation Potential Factor Values

Hazardous Substance	Food Chain Toxicity Factor Value	Persistence Factor Value	Food Chain Bioaccumulation Potential Factor	Tox/Per/Bio Factor Value	Reference
2,3,7,8-Tetrachlorodibenzo-p-dioxin	10,000	1	5,000	5E+7	Ref. 3, p. 29
1,2,3,7,8-Pentachlorodibenzodioxin	10,000	1	50,000	5E+8	Ref. 3, p. 35
1,2,3,4,7,8-Hexachlorodibenzodioxin	10,000	1	50,000	5E+8	Ref. 3, p. 13
1,2,3,6,7,8-Hexachlorodibenzodioxin	10,000	1	5,000	5E+7	Ref. 3, p. 15
1,2,3,7,8,9-Hexachlorodibenzodioxin	10,000	1	50,000	5E+8	Ref. 3, p. 17
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	10,000	1	50,000	5E+8	Ref. 3, p. 7
2,3,7,8-Tetrachlorodibenzofuran	10,000	1	50,000	5E+8	Ref. 3, p. 31
1,2,3,7,8-Pentachlorodibenzofuran	0	1	50,000	0	Ref. 3, p. 25
2,3,4,7,8-Pentachlorodibenzofuran	10,000	1	0.5	5E+3	Ref. 3, p. 27
1,2,3,4,7,8-Hexachlorodibenzofuran	10,000	1	50,000	5E+8	Ref. 3, p. 33
1,2,3,6,7,8-Hexachlorodibenzofuran	10,000	0.4	0.5	2E+3	Ref. 3, p. 19
2,3,4,6,7,8-Hexachlorodibenzofuran	10,000	0.4	0.5	2E+3	Ref. 3, p. 23
1,2,3,7,8,9-Hexachlorodibenzofuran	10,000	0.4	0.5	2E+3	Ref. 3, p. 21
1,2,3,4,6,7,8-Heptachlorodibenzofuran	10,000	1	50,000	5E+8	Ref. 3, p. 9

Table 11
Surface Water Pathway - Hazardous Substance Toxicity, Persistence and Bioaccumulation Potential Factor Values

Hazardous Substance	Food Chain Toxicity Factor Value	Persistence Factor Value	Food Chain Bioaccumulation Potential Factor	Tox/Per/Bio Factor Value	Reference
1,2,3,4,7,8,9-Heptachlorodibenzofuran	10,000	0.4	0.5	2E+3	Ref. 3, p. 11

Factor values for each hazardous substance were obtained from the Superfund Chemical Data Matrix (SCDM) 2004. "River" was the predominant surface water body type used to determine the persistence factor value. Bioaccumulation factor (BCF) data are available in SCDM for fresh water and salt water for the hazardous substances being evaluated. BCF data for the hazardous substances being evaluated are identical for salt and fresh water (Ref. 3).

Seven of the substances in Table 11 have Toxicity/Persistence/Bioaccumulation Factor Values of 5×10^8.

Toxicity/Persistence/Bioaccumulation Factor Value = 5×10^8

4.1.3.2.2 Hazardous Waste Quantity

Table 12 Surface Water Pathway - Hazardous Waste Quantity		
Source Number	**Source Hazardous Waste Quantity Value (Ref. 1, Sec. 2.4.2.1.5)**	**Is Source Hazardous Constituent Quantity data complete? (yes/no)**
1	28,246.846	no
Sum of Values:	28,246.846	

The sum of the source hazardous waste quantity values is used to select a Hazardous Waste Quantity Value from Table 2-6 of the HRS Rule. The sum of the source hazardous waste quantity values for the San Jacinto River Waste Pits site to the nearest integer is 28,247.

From the HRS Rule Table 2-6, this corresponds to:

Hazardous Waste Quantity Factor Value = 10,000

4.1.3.2.3 Human Food Chain Threat - Waste Characteristics Factor Category Value

The Human Food Chain Threat Waste Characteristics Factor Category Value is equal to the product of the Hazardous Waste Quantity Factor Value (10,000), Toxicity Factor Value (10,000), Persistence Factor Value (1), subject to a maximum value of 1×10^8, multiplied by the Bioaccumulation Potential Factor Value (50,000) subject to a maximum value of 1×10^{12}.

$10{,}000 \times 10{,}000 \times 1 \times 50{,}000 = 5 \times 10^{12}$

Human Food Chain Threat Waste Characteristics Factor Category Value = 1,000
(Ref. 1, Table 2-7, Section 2.4.3.1)

4.1.3.3 Human Food Chain Threat - Targets

An observed release by direct observation and chemical analysis was documented in the San Jacinto River (Ref. 7, pp. 004-006; Section 4.1.3.1.1 of this HRS documentation record).

4.1.3.3.1 Food Chain Individual

The San Jacinto River is a documented fishery (Ref. 50, p. 001; Ref. 51, pp. 007-010). Crabbing was documented within the TDL (Ref. 50, p. 001; Ref. 51, pp. 007-010). Consumption of the crabs is documented (Ref. 50, p. 001; Ref. 51, p. 010). There is an observed release of multiple substances with bioaccumulation potential factor values of 500 or greater to surface water in the watershed (see Tables 10 and 11 in this HRS documentation record). Therefore, a value of 20 is assigned to the Food Chain Individual Factor Value (Ref. 1, Section 4.1.3.3.1).

Food Chain Individual Factor Value = 20

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

No Level I concentrations were documented.

4.1.3.3.2.2 Level II Concentrations

As a conservative approach, Level II concentrations are not used in this HRS documentation record.

4.1.3.3.2.3 Potential Contamination

Potential contamination was evaluated but not scored due to its minimal contribution to the overall site score.

4.1.3.3.3 Calculation of Human Food Chain Threat - Targets Factor Category Value

Food Chain Individual Factor Value + Population Factor Value = Human Food Chain Threat Targets Factor Category Value

20 + 0 = 20

4.1.3.4 Calculation of Human Food Chain Threat Score for a Watershed

The Human Food Chain Threat for a Watershed is equal to the product of the Human Food Chain Threat Factor Category Values for Likelihood of Release (550), Waste Characteristics (1000) and Targets (20), divided by 82,500 and subject to a maximum value of 100.

$$\frac{550 \times 1000 \times 20}{82{,}500} = 133.3$$

Human Food Chain Threat Score for the Watershed = 100

4.1.4 Environmental Threat

The environmental threat was not scored in the HRS evaluation of the San Jacinto site, as evaluation of other factors was sufficient to assign a maximum score in the Surface Water Overland/Flood Migration portion of the overall site score. However, Harris County Public Health and Environmental Services (HCPHES) noted that environmental targets exist within the relevant TDL and should be considered when more extensive investigations are undertaken at the site. Specifically, HCPHES identified the following State designated endangered or threatened species: Brown Pelican, *Pelecanus occidentalis*; Loggerhead sea turtle, *Caretta caretta*; Green sea turtle, *Chelonia mydas*; Leatherback sea turtle, *Dermochelys coriacea*; and Alligator snapping turtle, *Macrochelys temminckii*. EPA will consider the threat to these targets when the Agency performs more extensive investigation under the RI/FS.

5.0 SOIL EXPOSURE PATHWAY

5.0.1 General Considerations

The Soil Exposure Pathway was evaluated but not included due to the lack of an observed release and the pathway's minimal contribution to the overall site score.

6.0 AIR MIGRATION PATHWAY

6.0.1 General Considerations

The Air Migration Pathway was evaluated but not included due to the lack of an observed release and the pathway's minimal contribution to the overall site score.